

RESEARCH ARTICLE

Rice and the Mirage of Food Security: Examining the Production and Marketing Value Chains of Rice in Taraba State, Nigeria, 1991-2023

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Abstract Nigeria is the leading rice producer in Africa, but still relies on import to satisfy local demand. This is particularly the case where current statistics shows that rice demand in the country stands at ten thousand metric tons, against seven thousand metric tons the country currently produces. Taraba State which is one of the leading producers of rice in the country, still falls short of demand within the state. Hence, the study focused on interrogating the rice production system or the agronomic practices accountable for rice output, and the marketing value chains responsible for value allocation. The study engaged qualitative approach, and was anchored on Marx's theory of primitive accumulation. The findings indicate that problems associated with input supply, extension services, and optimal agronomic practices are in short supply. The market system is also confronted with issues relating to basic infrastructures such as road, warehouses, and transport system leading to the deprivation of farmers from surpluses thereof. Thus, the state government need to midwife these processes and practices to ensure bumper harvest, and food sovereignty.

Keywords: rice value chain, food insecurity, primitive accumulation, smallholder farmers, Taraba state, agricultural governance

1 Introduction

Although Nigeria is the foremost rice producer in Africa, it remains reliant on imports to satisfy its increasing demand. This indicates that production is insufficient to meet the quantity needed in metric tons. Rice is the second most eaten food crop globally, following maize; however, its supply seldom satisfies demand. The Asian continent leads worldwide rice production, with China and India as the foremost producers, accounting for 29.6 percent and 22.6 percent of total production, respectively (Udemeze, 2018). Rice ranks among the top three staple food crops globally, alongside maize and wheat. The trio collectively accounts for around 42% of the global caloric requirements. Rice accounts for 19 percent of worldwide human per capita energy and 13 percent of per capita protein. It is cultivated on almost 144 million rice farms, predominantly less than 1 hectare. Consequently, rice cultivation is essential for global food security and serves as a significant source of employment, income, and sustenance, particularly for rural populations (PwC, 2018). In 2009, human consumption constituted 78 percent of the total rice production utilization. Rice serves as a staple for around 3.5 billion individuals, constituting at least half of the global population. Africa, Latin America, and the Middle East are significant markets for rice consumption and demand, but major rice-producing nations like China and India, along with other Asian countries, collectively represents approximately 90 percent of global rice consumption. In 2017, China was responsible for 210 million metric tons, while India contributed to a total global consumption of about 477.77 million metric tons in 2016/2017 (Udemeze, 2018).

The rice economy in Nigeria is concerning. Nigeria emerged as the largest producer of rice in Africa, the leading consumer, and concurrently the world's third largest importer of rice (Thrive Agric, 2020). In 2019, Africa's total rice production was 14.6 metric tons, with Nigeria accounting for around 55 percent of this volume, positioning it as the 14th largest rice producer globally, while China held the top spot. Rice is among the most widely used commodities in

Nigeria, with a consumption increase of 4.7 percent over the past decade, nearly quadrupling the global consumption growth, and reaching 6.4 million tons in 2017, representing 20 percent of Africa's total consumption (PwC, 2018). Currently, rice is no longer a luxury for millions of Nigerians; it has evolved into a staple grain that serves as a significant source of calories for both rural and urban impoverished populations, with demand increasing at an annual rate of 5 percent. Urbanization, alterations in job trends, wealth disparities, and swift population growth have markedly exacerbated the imbalance between rice supply and demand in Nigeria (Oikeh et al., 2021).

The rice pyramid represents bumper harvest, as demonstrated during the 5th Anniversary of the Anchor Borrowers Program (ABP) in 2021 (Bakare, 2021). But the question of food sovereignty has continued to elude the country as a nation. Taraba State represent one of the rice hubs in Nigeria, with potentials to increase in terms of production and market. But even the state is in short supply in terms of rice output. This raises a number of questions around the nature of the agronomic practices, which can be held accountable for production output, and the market dynamics for surplus allocation. Hence, this study investigated the rice production and marketing value chains/practices in Taraba State. The main aim of this study was to:

- (1) Examine the agronomic practices associated with rice production among the farmers;
- (2) Discuss the issue of mechanisation;
- (3) And interrogate the rice marketing value chains and value allocation.

2 Research Methodology

The study area is Taraba State, North East Nigeria. The study deployed the use of historical methodology that aligns with qualitative approach. Both primary and secondary sources of data were used. The primary sources included oral interviews with farmers and entrepreneurs in the agribusinesses, which helped the researcher access key industry stakeholders and collect unrecorded firsthand field information. Focus group discussions were also held with farmers in selected areas cutting across the three geo-political zones in the state.

Purposive stratified sampling guided all primary field data collection. Focus group discussions were conducted across Taraba State's three geopolitical zones, as explicitly planned in the fieldwork design. The sampling frame incorporated the full spectrum of local rice production systems documented in the study: rain-fed upland, rain-fed lowland, and irrigated lowland cultivation, which coexist widely across the state's agricultural terrain. In each geopolitical zone, research sites covering two distinct farm typologies were selected: smallholder peasant operations, which constitute the vast majority of rice producers, and commercial large-scale farms concentrated in northern local government areas such as Karim-Lamido and Lau.

Individual semi-structured interviews were carried out with 20 stakeholders, whose complete demographic and occupational records are listed in the primary source interview appendix. This interview sample intentionally included a cross-section of key rice value chain actors: ordinary peasant farmers, commercial rice mill proprietors, state agricultural extension officers, and formal representatives of the Taraba State branch of the Rice Farmers Association of Nigeria (RIFAN). Complementary zone-wide focus group discussions with resident farmers supplemented individual interviews to capture shared grassroots perspectives on agronomic constraints and market challenges.

The information obtained from these field activities greatly enriches this study. Other primary sources were stakeholders consulted which included amongst others the State Ministries of Agriculture and Land and Survey, and the Taraba State branch of the Rice Farmers Association of Nigeria (RIFAN). The Secondary sources comprised both published and unpublished materials, including books, manuscripts, journal articles, MA dissertations. Both the primary and secondary sources were used complementarily to strengthen the study.

The multi-disciplinary method of data collection was also leveraged. History as a discipline is no longer isolated, so insights from other subject areas were integrated to deliver a broader analytical perspective on the research topic. Since the rice value chain falls within social and management science domains, peer-reviewed publications from these fields were consulted to enrich the analysis. For data presentation and interpretation, a thematic analytical approach was adopted. Given the study's grounding in economic history, the manuscript is structured around core research themes to facilitate in-depth empirical discussion.

3 Conceptual Clarifications

3.1 Food Insecurity

According to Food and Agricultural Organisation, the concept food insecurity refers to a situation in which individuals or households do not have consistent physical, social, or economic access to sufficient, safe, and nutritious food required to maintain a healthy and productive life [FAO \(2023\)](#). It arises when people are unable to obtain adequate food because of factors such as poverty, low agricultural productivity, conflicts, environmental challenges, natural disasters, and fluctuations in food prices. Food insecurity may be temporary, seasonal, or long-term depending on the nature and duration of the circumstances that restrict access to food.

The concept extends beyond the mere availability of food. It encompasses four critical dimensions: food availability, accessibility, utilization, and stability. Food availability concerns the existence of adequate food supplies through domestic production, imports, or food aid. Accessibility refers to people's ability to acquire food through production, purchase, or exchange. Utilization relates to the nutritional value of food and the body's capacity to absorb essential nutrients, while stability emphasizes the continuous availability and accessibility of food over time. When any of these dimensions is compromised, households may experience hunger, undernourishment, and other forms of malnutrition ([FAO, 2008](#)).

According to [FAO \(2023\)](#), food insecurity exists whenever people lack regular access to enough safe and nutritious food necessary for normal growth, development, and an active life. In developing countries such as Nigeria, food insecurity remains a major developmental challenge due to rapid population growth, insecurity in farming communities, climate variability, inadequate infrastructure, and declining agricultural productivity. For the purpose of this study, food insecurity entails all the situation in which individuals or households do not have consistent physical, social, or economic access to sufficient, safe, and nutritious food required to maintain a healthy and productive life

3.2 Food Production

Another important concept that provides a framework base for this study is food production. It has been described from diverse perspectives. A major definition provided by Food and Agricultural Organisation is that it relates to the various activities involved in cultivating crops, rearing livestock, harvesting aquatic resources, processing food products, and distributing them for human consumption ([FAO, 2023](#)). It constitutes a fundamental aspect of agriculture and serves as the backbone of food security, economic growth, and rural development. The process includes land preparation, planting, irrigation, pest management, harvesting, storage, processing, transportation, and marketing of food products ([Mellor, 1966](#)).

Food production is generally categorized into crop farming, livestock rearing, fisheries, and forestry. Crop production focuses on the cultivation of cereals, vegetables, fruits, and legumes, while livestock production involves the breeding and management of animals such as cattle, sheep, goats, and poultry. Effective food production depends on the availability of fertile land, favorable climatic conditions, improved agricultural technologies, access to credit facilities, quality seeds, fertilizers, mechanization, and supportive government policies ([Todaro & Smith, 2020](#)).

The importance of food production extends beyond the provision of food. It contributes significantly to employment generation, poverty reduction, industrial development, foreign exchange earnings, and overall economic growth. Increased agricultural output strengthens food availability and reduces dependence on imported food commodities. In agrarian economies such as Nigeria, food production remains a crucial sector for achieving sustainable development and improving the welfare of rural populations ([Griffin, 1974](#)). In this study, food production relates to the various activities involved in cultivating crops, rearing livestock, harvesting aquatic resources, processing food products, and distributing them for human consumption.

3.3 Theoretical Framework

One of the leading and earliest theories that provide explanation to the activities of the market forces, foreign capital monopoly and in this case large-scale farms, is the Marxist theorisation of 'primitive accumulation'. Broadly known as Marxian dialectics, the theory is concern with laws

of society, which determine social change. Maintaining the Hegelian dialectics, Marx infused economic factors which he regards as the sole determinant of social change. This came to be known as “dialectical materialism” or Marxian dialectics (Roll, 1992).

Marxian dialectics was an anatomy of society as well as a philosophy of social transformation. Marx claimed in his early works on capitalist production that history is the story of alienation in people’s lives as producers, particularly under modern capitalism (Ekelund Jr et al., 1989). In his Economic and Philosophical Manuscripts, Marx articulated that labour constitutes the foundation of all wealth; but the labourer receives just a marginal portion of this value, insufficient to sustain continued employment. The majority of the labour’s output is appropriated by the capitalist, resulting in a contentious conflict between capital and labour. In this conflict, the objective of the capitalist, who possesses all the advantages, is to maintain wages at the minimum level. Under capitalism, labour is reduced to a basic commodity, and all human interactions are ultimately transformed into monetary transactions. In these dynamics, the capitalist invariably profits at the worker’s expense, who subsists at a minimal level.

In primitive accumulation, Marx delineates processes including commercialisation and privatisation of land, the transformation of communal property into private property, and the repression of rights to the commons (Benjaminsen & Bryceson, 2012). His definition of ‘primitive accumulation’ was ‘the historical process of separating the producer from the means of production’. This indicates the seizure of land and resources from the peasantry, resulting in a pool of inexpensive labour. Marx supports his argument with the “Enclosure System” in England, which subsequently supplied labour for industrialization.

Accordingly, Marxist theory, particularly his argument on primitive accumulation, provides the theoretical foundation for this study. The transformation of the agrarian system through dialectical change from subsistence-oriented farming to a largely commercial agribusiness structure results in the alienation of farmers, who are reduced to commodities within capitalist relations of production. Although they constitute the primary producers, farmers receive only a marginal share of the wealth generated under an inequitable market distribution system, limiting their capacity to respond effectively to the dynamics of supply and demand in agricultural production and, by extension, undermining productivity and livelihoods. This challenge is further intensified by inadequate governmental commitment to agriculture, especially in the provision of essential inputs to farmers. Within this context, the emerging agro-industrial sector creates a dynamic linkage between farm and non-farm activities, and given that the rural sector absorbs a substantial proportion of labour in Nigeria, the evolution of such a sector from the agrarian base represents a concrete social reality (Benjaminsen & Bryceson, 2012). From this perspective, agribusiness has the potential to contribute to the advancement of productive forces within the existing mode of production toward a more developed stage; however, inadequate governmental incentives and the dominance of unregulated market forces have rendered farming increasingly unsustainable for producers.

4 Result and Discussion

4.1 An Overview of Rice Production in Nigeria

Nonetheless, despite being Africa’s foremost rice producer, Nigeria is unable of satisfying its consumption requirements. Rice production increased from 3.7 million metric tons in 2017 to 4.0 million metric tons in 2018 (Kamai et al., 2020). The current consumption rate is 7.9 million tons, with rice demand anticipated to increase to an estimated 555 million metric tons by 2035. Currently, Nigeria can fulfil only 49% of its local demand and depends on imports to satisfy the remaining 51% (Udemeze, 2018). Hence the country’s rice importation is over 3 million tons annually, equivalent to over US\$480 million in scarce foreign exchange (Kamai et al., 2020). The country’s failure to satisfy local demand is attributed to deficiencies in manufacturing and processing technologies. The demand for rice is increasing at a rate that surpasses supply, influenced by factors such as population increase and urbanization.

The cultivable area in Nigeria is estimated at 4.234 million hectares, comprising 30% rain-fed uplands, 52% rain-fed lowlands, 17% irrigated lowlands, and 1% mangroves. Rice cultivation presently exhibits a low average yield, typically ranging from 2.5 to 4.0 t/ha, which has remained consistent since the 1960s. Moreover, there exists significant variability in yields and substantial yield disparities of 1-4 tons per hectare between average and below-average farmers’ yields

FMARD (2020).

Nigeria possesses approximately 4.234 million hectares of arable rice land, yet only around 720,000 hectares are equipped with irrigation infrastructure. Of this, merely 60% have comprehensive water control mechanisms, including a water head or dam, while the remainder relies on partial or seasonal water management systems (FMARD, 2020). Approximately 2.2 million hectares presently designated as rain-fed lowlands might be converted into fully irrigated regions, allowing for the cultivation of 2 to 3 crop cycles annually. This would result in a total of approximately 2.75 million hectares of irrigated land. Presently, there are 27 dams nationwide with a cumulative capacity to irrigate 550,000 hectares of rice cultivation (FMARD, 2020). Irrigated lowland exhibits the largest production potential, ranging from 6 to 9 tons per hectare; hence, investment in irrigation infrastructure and the formation of Water Users Associations (WUA) for enhanced management of these facilities are prominent. Expanding irrigated land from 500,000 to around 2 million hectares, with an average yield of 4-5 tons per hectare, may yield 8-10 million tons of paddy per crop cycle, resulting in an annual production of 16-20 million tons over two cycles per year. Investments aimed at converting rain-fed lowlands into irrigated areas with complete or partial water management mechanisms are essential for enabling farmers to cultivate two crop cycles annually, hence ensuring Nigeria's self-sufficiency in sustained paddy production amidst a growing population. However, policies designed to create a conducive climate for Public-Private Sector Partnership investment in irrigation systems are inadequate, and the current ones are ineffective.

The rate of mechanization in Africa, particularly in Nigeria, has been sluggish and inadequate to enhance rice output (PwC, 2018). Nigeria's rice yield is among the lowest in the world, at 2 tonnes per hectare, compared to 4 to 7 tonnes per hectare in Asia. Over 80% of Nigeria's rice is cultivated by small-scale farmers, whereas the other 20% is produced by commercial growers (PwC, 2018). Furthermore, the majority of the processors are small-scale, possessing low capacity (under 300 kg/hr) and outdated mills. Production limitations in the rice value chain encompass insufficient mechanization, restricted availability of agrochemicals and fertilizers, minimal adoption of contemporary varieties, and poor extension services. The deployment of tractors has remained low at 0.3 hp/ha, compared to 2.6 hp/ha in India and 8 hp/ha in China. The estimated number of agricultural tractors is approximately 22,000, compared to 1 million in China and 2.5 million in India. Insufficient income, restricted access to reasonable financing, and a deficiency in technical skills have constrained the use of mechanization throughout the rice value chain (PwC, 2018).

4.2 Rice Production and the Agronomic Practices in Taraba State

Rice is a predominant staple crop in Nigeria, produced in over 18 states including Taraba (PwC, 2018). Nigeria is facing a 51 percent shortfall in rice output, almost 3 million metric tons, prompting an examination of rice production in Taraba State, a prominent producer in the nation. According to a survey by the National Bureau of Statistics, Taraba State is among the principal rice producers in the nation, with Kogi State in the forefront, (NBS, 2019). Kogi now leads with over 8,000 metric tons based on the 2017/2018 and 2018/2019 agricultural seasons. States such as Benue, Kaduna, Kebbi, Kwara, and Nasarawa belong to the second category, each producing over 6000 metric tons within the same timeframe. The third group comprises Kano and Niger States, which have recorded above 5,000 metric tons. Taraba State, in conjunction with Adamawa, Bauchi, Plateau, and the Federal Capital Territory, is classified in the fourth category, producing above 4000 metric tons throughout those agricultural seasons (NBS, 2007). Documents regarding rice output in Taraba State from 1991 to 2001 are scarce; however, existing records from 2002 to 2023 indicate a consistent albeit negligible development, attributed to limited utilization of modern agricultural techniques (TSADP, 2024). Table 1 shows rice production trends in Taraba State since 2002.

4.3 Agronomic Practices

Several optimal agronomic strategies are essential for achieving high yields and maximizing value in rice farming. These practices encompass the utilization and accessibility of inputs amongst others like seeds; soil analysis; fertilizer application and weed management; planting and spacing; as well as infrastructure including roads, warehouses, and transportation systems, among others (Dodo et al., 2024). Initially, land preparation is crucial, and agricultural areas are prepared under two conditions: either in dry or wetland. The selection between dry or

Table 1 Paddy Rice Cultivated Area and Production Volume, Taraba State (2002–2023)

S/N	Year	Area Per Hectare	Production (000 MT)
1	2002	124.28	202.81
2	2003	136.68	226.24
3	2004	144.11	240.00
4	2005	150.00	258.00
5	2006	156.23	306.13
6	2007	150.15	315.31
7	2008	147.77	224.93
8	2009	157.77	331.31
9	2010	203.77	294.00
10	2011	203.00	294.23
11	2012	157.70	289.30
12	2013	160.73	309.30
13	2014	121.80	328.30
14	2015	127.21	390.10
15	2016	160.83	324.14
16	2017	173.83	366.12
17	2018	189.46	417.34
18	2019	190.64	405.72
19	2020	191.85	386.54
20	2021	194.08	388.16
21	2022	183.13	402.89
22	2023	229.03	526.78

Source: Taraba State Agricultural Development Project, 2024

wetland conditions is contingent upon several factors, including the timing of operation, soil characteristics, and the implements utilized (Phillip et al., 2018). The fields must be disc ploughed promptly after harvest in November or December (for wet season farming) to expose perennial weeds to the intense sunlight. The field is harrowed immediately prior to the initial rainfall for direct-seeded rice, and the crop is sown. The field is inundated with the initial rains for wet or transplanted rice. In the absence of Plows, create mounds at the commencement of the initial rains for weed management.

The seed system is a crucial element for the success of rice cultivation. Nigeria cultivates numerous varieties of rice. Some are 'classic' kinds, but others have been introduced in the past two decades. Rice is cultivated in highland fields, lowland fields, and occasionally in mangroves, contingent upon the variety. The dissemination of these rice cultivars is contingent upon their agricultural performance and market valuation (Oluwatoyin Olorunsanya & Utsunu Ugbong, 2014). There are fundamentally three varieties of rice farmed in Nigeria. The varieties include African rice, *Oryza glaberrima*; Asian rice, *Oryza sativa*; and, more recently, WARDA's hybrid rice, *NERICA*, which is only accessible to farmers participating in WARDA's PVS program (Longtau, 2003). *Oryza glaberrima* has long been recognized as Indigenous African rice. The wild rice of Lake Chad, *Oryza barthii*, was frequently harvested in the eighteenth century. The origin of rice is associated with several locations, including Mufatai—present-day Makari south of Lake Chad; Afae Eotoko and Duru in Cameroon; while some suggest Sokoto among the Hausa (Selbut, 2003). Regardless of the circumstances, this suggests that *Oryza glaberrima* originates from Africa and serves as a staple food.

The Asian rice *Oryza sativa*, introduced to the coast by the Portuguese, is extensively planted across Nigeria by both Hausa migrants and indigenous farmers. *Oryza sativa* rice is classified within the *Gramineae* family, regarded as the most significant of all cultivated crops (Abdullahi, 2015). The origin of rice is associated with China, along with other varieties of Asian rice such as *indica* and *japonica*, which are believed to have emerged from a singular domestication event that transpired 8,200-13,500 years ago in China involving the wild rice *Oryza rufipogon*, a timeframe consistent with existing archaeological evidence. The British introduced two shallow swamp kinds of *Oryza sativa*: BG.79, originating from Guinea, and MAS 2401, from Indonesia (Jiddah, 2002). The seeds were delivered by the colonial divisional officials, who then entrusted them to community leaders for allocation to farmers. Each farmer was required to return double the quality of seeds provided to him after the harvest, which were subsequently dispersed to other farmers in the following cropping year. This illustrates the dissemination of variations throughout the country during the colonial era. The advancement of rice research in Nigeria has resulted in the release of *NERICA*, hybrid rice developed by the robust scientific collaboration

known as the West African Rice Development Association (WARDA). This rice variety is delivered to farmers directly via projects or indirectly through migrant cultivators (Blench, 2004).

The National Seed Service (NSS), the National Cereals Research Institute, agro-dealers, and several agricultural departments, including the World Bank-assisted Agricultural Development Project (ADP), play significant roles in the seed system. The seed variety utilized by farmers influences the yield. Historically, farmers depended on their accumulated experience in agriculture. The selection of different seeds and their resultant yields ultimately determined the type of seed they used. The research institute has addressed the information gap regarding seed systems, supplying farmers with seed varieties that ensure optimal production. Currently, Faro 44, Faro 52, and Gawal R1 demonstrate promising yields, whilst Faro 66, 67, and 68 are cultivars resistant to flooding. Faro 68 is a novel cultivar that also endures drought (Dodo et al., 2024). The kind of soil is a crucial factor in rice cultivation. Over the years, farmers in the state have depended on their experience to ascertain the type of soil or land utilized for rice farming. An accurate soil study establishes the specific quantity of seed needed. For instance, Faro 44 performs effectively in lowland areas, but Faro 68 endures flooding and other stressors (Interview with Oga Habu Haruna, Age 57, TADP, Jalingo, 3/3/2025). Farmers predominantly rely on personal expertise due to a lack of communication with extension agents and challenges in accessing pertinent information on optimal farming practices.

Planting density and spacing are key considerations in rice cultivation. Common planting techniques include broadcasting, direct seeding, and transplanting. Broadcasting has long served as the conventional practice owing to its high efficiency, time-saving nature, and low labor requirements. A few individuals can cover extensive areas of land in a brief timeframe. However, research has demonstrated that such practices result in significant waste, as a considerable percentage of seeds go buried in the soil, and optimal spacing necessary for maximizing yields is not maintained. Nevertheless, contemporary methods like direct seeding and transplanting addresses this deficiency. Direct seeding requires a spacing of 20 by 20 cm, utilizing 2 to 3 seeds per planting to ensure optimal yield and seed quality (Dodo et al., 2024). Transplanting is predominantly a method linked to dry season agriculture. Rural farmers throughout the state have not yet adopted dry season farming, primarily due to insufficient expertise and significantly due to the capital required for the practice. However, there is a significant influx of large-scale farmers in the northern regions of the state engaged in dry season agriculture. The territories encompass Karim-Lamido, Lau, Jalingo, Ardo-Kola, and Gassol in the central region of the state. A significant percentage of farmers continue to employ the traditional broadcasting method of planting, which has consistently negatively impacted crop productivity (Dodo et al., 2024).

Weed management and fertilizer application are technical aspects of rice cultivation operations. Any inaccuracy or misapplication in this process ultimately impacts the output. Contemporary best practices necessitate the application of glyphosate before planting, at the onset of either the wet or dry season, to address hardened weeds before tilling the soil, hence facilitating unobstructed rice growth (Umiyati et al., 2024). Eight days post-operation, pre-emergent herbicides such as Patria and Armigold are anticipated to be utilized to suppress emerging weeds and facilitate optimal rice development. Fourteen (14) days later, NPK fertilizer is anticipated to be applied to promote healthy growth. It is customary to apply four bags of NPK per hectare of rice cultivation. Two bags of Urea will be applied per hectare of rice farm six weeks after the initiation of planting, followed by a wait for the final harvest. The two most widely cultivated improved rice cultivars in the state have respective growth cycles of 90 and 120 days before harvesting. Nevertheless, the majority of farmers do not comply with these contemporary best practices mostly due to ignorance and, to some extent, financial constraints. For instance, eight days post-planting, when pre-emergent applications are necessary to inhibit emerging weeds, herbicides such as gasfot and miyatron, mostly intended for maize, are instead utilized. These herbicides, frequently referred by farmers as Lipton, ultimately suppresses weeds but also weaken and, in some instances, hinder the growth of rice, often resulting in diminished harvests (Umiyati et al., 2024).

These deficiencies reveal the disconnection between farmers and extension professionals tasked with closing the information gap about contemporary best practices. Extension agents are expected to educate farmers on the essential best practices to improve productivity. The absence of communication with agents has compelled farmers to depend on their experiences, which often do not meet standard requirements, resulting in rice paddy wastage during planting and

hindering rice development owing to improper herbicide application. Broadcasting, a prevalent practice among farmers, inhibits adequate growth and hence results in suboptimal harvests. In a hectare of rice farm employing optimal agronomic principles, the yield can reach approximately 100-120 bags of rice paddy; however, under conventional farming methods, the typical harvest is only about 40-50 bags. This clearly diminished the yield to less than fifty percent of the value of rice grown under optimal agronomic procedures.

The causes of these deficiencies are threefold or greater. A significant portion of extension services is intended to be delivered by the government. However, the State Ministry of Agriculture, which is responsible for delivering such services, is experiencing a manpower deficit. The entity accountable for this is the Agricultural Development Project (ADP), officially backed by World Bank financing. Currently, ADP is receiving less attention from the state government, resulting in inadequate funding. This is evident from the number of departmental workers unable to provide extension services statewide. The standard ratio of an extension agent to farmers is 1:8 or 1:10. Currently, there are 1:500 farmers, which cannot ensure efficiency. Farmers are inadequately insured as mandated. In addition to insufficient extension agents, there exists a deficiency of trust or confidence between farmers and the government. Historically, extension agents have typically approached farmers with assurances of delivering specific services, including seedlings, herbicides, or fertilizers, among others. However, such promises were never fulfilled, as they were neither delivered nor were the farmers adequately compensated in the process. Occasionally, even when extension services are accessible, farmers do not avail themselves.

Insufficient finance constitutes an additional issue. A site visit to the State Ministry of Agriculture, specifically the ADP department, significantly reflects the government's stance on agricultural development. The office infrastructure has deteriorated, and furniture is either absent or outdated in several offices and insufficient funds for staff to do their tasks efficiently. They are not significantly engaged as primary stakeholders in issues related to agricultural development within the state. An exemplary instance of this degree of neglect is the recent acquisition of tractors by the state government without prior consultation to ascertain the requisite regions of involvement. There is significant negligence and insufficient budget for the ministry to fulfil its responsibilities adequately. All these programs exhibit a deficiency in synergy and inclusivity for agricultural growth in the state.

The state ministry seeks to rectify the disconnection between extension agents and farmers using mass media strategies, particularly utilizing cable networks within the state. Due to the absence of funding for effective extension activities, ADP periodically collaborates with Shomo FM or Taraba State Broadcasting Services (TSBS) activities. The selection of cable network is due to the reality that the majority of rural farmers possess only transistor radios, which they utilize to access services like Shomo FM and TSBS. A substantial demographic of transistor radio users exists among them, rendering it the most accessible method of communication. In this manner, knowledge on contemporary optimal agricultural techniques is disseminated. The farmers also made inquiries during these programs to seek clarification on ambiguous topics and to acquire knowledge regarding the procurement of specific services and products, such as pesticides and seeds. However, this method is insufficient to resolve the current issues faced by farmers. Non-governmental organizations offer extension services to farmers within their purview, and these interventions are often insufficient, as NGOs typically have specific targets or a limited number of farmers they assist, which frequently excludes many farmers throughout the state. Instances of this type of intervention include those offered by the International Fund for Agricultural Development (IFAD), Value Chain Development Agency and the World Bank FADAMA Cares Projects within the state. Their therapies are efficacious, although exhibit restricted coverage. For instance, IFAD encompasses only eight (8) of the sixteen local government areas within the state (Zubairu et al., 2018) while FADAMA Cares covers only (5) LGAs with a farming population of about fifteen thousand, and four thousand for IFAD and FADAMA respectively.

4.4 Mechanisation

Apart from the modern agronomic practices that we have discussed earlier, the issue of mechanization is pivotal. What was widely obtainable in primitive societies was the use of implement such as wooden ploughs driven by ox or donkeys and hoes of different shapes used by men. The use of such implements has continued through colonial and post-colonial eras.

However, the introduction of modern implement which started during the colonial era – though very little as most of the methods used were peasant based. The use of modern technology in post-colonial era is still insignificant. This is particularly the case with the use of tractors. The use of tractors which has replaced man power is not only faster, but efficient. However, the deployment of tractors in the state is far from being adequate. Statistics have shown that both the public and private tractors in circulation are not enough, given the fact that majority of the population in the state are farmers. Equally important, is the use of harvesters widely in use in the western world and leading rice producing countries such as China and India etc. This harvester helps in containing wastages of the seed during harvest and prevents mixing up produce with stones and debris. The traditional method involving the use of hand sickle, and shelling leads to a lot of seed going unaccounted for, or mix up with stones during harvest. But combined harvester ensures clean harvest without wastages. Such machine is scarce in the state at the moment, only one of the large-scale farmers is in possession of one. This goes to show that most of the methods being used is still traditional. This partly explains poor harvest, as compared with those countries who involve the use of modern technology.

Application of modern farming technology relevant for sufficient agricultural production is significantly in short supply in Taraba State. The use of tractor for example which replaces human labor and ensure large scale utilization of the massive agricultural space is insufficient. Tractor is central to agricultural mechanization and a major indicator for assessing level of agricultural development for a country. Food and Agricultural Organization recommended 0.2 Hp/ha tractorization density level for developing countries while developed countries have 1.2 Hp/ha [NAERLS and FMARD \(2020\)](#). Over 1 million tractors are required to meet FAO's recommended minimum standard in Nigeria. Despite the low tractor density of the country, available tractors are largely in bad condition. Tractor overhaul facilities are scarce and replacement parts are difficult to obtain. A major setback to tractors hiring services operated by government is poor income generations from the services, resulting from misappropriation of the money generated, which subsequently makes government reluctant to release funds for routine and breakdown maintenance in most states including Taraba ([NAERLS & FMARD, 2020](#)). Although some remit proceeds to the state treasury, retrieving it for the purposes mentioned above as at when needed remained an issue. Thus, agricultural production in the state remained essentially traditional, relying heavily on manual labour. [Table 2](#) displays the level of mechanization in the state in terms of tractors deployment from 2010- 2020.

Table 2 Functional and Non-Functional Tractors by Ownership Type, Taraba State (2010–2020)

S/N	Year	Government Owned Tractors		Privately Owned Tractors	
		Functional	Non-Functional	Functional	Non-Functional
1	2020	Nil	Nil	Nil	Nil
2	2019	100	51	55	55
3	2017	7	7	94	62
4	2016	6	6	85	59
5	2014	14	34	46	45
6	2013	47	147	49	3
7	2012	53	141	Nil	Nil
8	2011	48	152	Nil	Nil
9	2010	43	141	Nil	Nil

Source: Rice Production, Processing, Utilization and Marketing in Nigeria, *Extension Bulletin No. 230* (2020)

[Table 2](#) clearly indicates that effort was not put in ensuring that mechanization was improved upon by the Taraba State government from 2010-2020. For instance, from 2010 to 2019, there were more non-functional government owned tractors than those in the private sector. The only period government seem to have made improvement was in 2019 when it had a little above 50 percent of non-functional tractors. Only the private sector seems to maintain a higher percentage of between 40-100 percentages functional tractors in Taraba State as against governments less than 20-40 percent.

4.5 Rice Marketing and Surplus Allocation

This is a significant link in the production sector in Taraba State. Rice marketing encompasses all business activities involved in the distribution of paddy and milled rice, from initial production to delivery to end consumers, ensuring timely availability, optimal location, convenience, and profitability to sustain the farmer's operations ([Akande & Akpokodje, 2003](#)). Nonetheless,

inefficiencies in the processing and marketing of domestically grown rice have heightened customer desire in Nigeria for imported varieties, which are favored for their long, white grains (Oluwatoyin Olorunsanya & Utsunu Ugbong, 2014). Imported rice, while sometimes deemed less palatable, requires minimal preparation due to the absence of stones. Removing stones from Nigerian rice by the utilization of a destoner or the construction of specialized threshing and drying floors will enable Nigerian rice to compete with imported varieties. Due to the seasonal nature of rice production and the year-round demand for consumption, supply must be adjusted to align with demand. This adjustment is facilitated through storage, which incorporates the temporal utility of the manufacturing process, typically managed by market actors. This guarantees that buyers receive the product at their preferred time. Consequently, rice marketing establishes the connection between production and consumption.

This implies that consumers must obtain value for their expenditure. This engenders competition over quality between imported rice and domestically produced rice. To compete effectively, the quality of this rice must be assured. Consequently, rice marketing commences at the production stage. Priority is currently assigned to the rice brand or model. The Faro series rice cultivars introduced earlier remain the most market-favored options, owing to their high yield potential, environmental adaptability and flood tolerance outlined in the agronomy section.

The harvesting procedure is crucial for ensuring high-quality rice. The method employed, as previously noted, remains conventional, utilizing hand sickles for cutting, gathering, shelling, and bagging, which requires substantial labour and is capital intensive. Consequently, large-scale farmers allocate their resources for harvesting to ensure the rice is free from debris and stones. The market commences here; it is essential to note that marketing initiates at the point of production at the farm gate. Many rural farmers lack the capital necessary to conduct such activities at that time. Consequently, large-scale rice entrepreneurs allocate their capital for the goal of market harvesting. During this procedure, the farmer is exploited and stripped of their produce. They are compelled to mortgage their products or compensate labor with their produce, which is often exploitative (Daudu et al., 2014).

Inadequate basic infrastructure inaccessible to farmers negatively impacts their position in the market value chain. These infrastructures encompass warehouses, roadways, and transportation systems or vehicles (TSNFDP III, 2015). The variables pertain to price distribution and connections with various rice markets. During the harvest period, rice prices often decline due to increased market availability. Consequently, even when a farmer is reluctant to sell the crop, he is compelled to do so due to the lack of available warehouses for storage. In such situations, farmers are compelled to sell rice directly from the farm gate to several enterprises. The condition of the roads leading to various rice-producing areas in the state is either severely deteriorated or unpaved, resulting in challenging and costly transportation. Many of the destinations are situated in challenging terrain or possess a highly intricate road network. Notable locations include Karim-Lamido, situated across the Benue River and necessitating a ferry for crossing; Lau, positioned on the banks of the River Benue, which experiences flooding during the rainy season, complicating movement; and Gassol, located off the Wukari, Jalingo, and Yola federal highway, among others. These locations either lack significant road infrastructure or the roads are in poor shape. The characteristics of the roads restrict the trucks used for transporting rice or agricultural products, resulting in high transportation costs. In a place such as Lau, the transportation cost for one bag of paddy rice to Jalingo, the Taraba State capital and a primary market destination, amounts to three thousand naira (3000).

Due to the intricacies of fundamental infrastructure, farmers are compelled to rely on several intermediaries, entrepreneurs, and large-scale rice millers commonly known as off-takers (TADP, 2015). They procure rice paddy for their milling mills situated in diverse areas nationwide, process it, and distribute it to various local, national, and international markets for retailers. Some parties erected warehouses directly on the farms or possess lorries for transporting these products. This indicates that farmers are being exploited due to inadequate basic infrastructure, such as warehouses, roads, and transportation, which often exceed their capabilities.

Rice is perpetually sought after in both local and national markets. Rice is one of the most sought-after products in the market places of Taraba State (NBS, 2007). Remarkably, there is a significant demand for rice even from prominent rice-producing states such as Ebonyi, Adamawa, Gombe, Borno, Yobe, Cross River and Akwa-Ibom. Main participants in rice production within the state also engage in the market (TADP, 2015). These actors who doubled

as millers and producers include: Al'uma Rice and Alganlaki, and Muphido amongst others (TSADP, 2024). Alhaji Rabi, from the Federal Ministry of Agriculture, asserted that rice marketing is a lucrative enterprise in Taraba State. He asserted that there are around six local off-takers in Taraba State which included Al'uma Rice Mill Ltd., Alganlaki Rice Mill, and Muphido Rice, all of which possess plants in Jalingo, the state capital, due to their proximity to urban regions and market accessibility (Smith & Dilday, 2003). He also avers that the inability to satisfy output demand stems from insufficient agriculture inputs and funding for the farmers. Alhaji Rabi, proprietor of Alganlaki Rice Mill, provides farmers with farm inputs such as fertilizers, credit, and Faro 44 seeds, which he first popularized across local growing communities. He stated that there are presently around one thousand farmers under his supervision, (Ogunniyi et al., 2021).

Nonetheless, he asserted that the emergence of Umza and Popular farms — the off-takers from Kano — presents a problem. The off-takers from Kano provided farmers with high prices at the farm gate, thus enabling some farmers to benefit from Alganlaki inputs and sell their rice paddy to the firms (Tondel et al., 2020). The local off-takers invested, yet another off-taker reaped the benefits, illustrating the adage, “monkey dey work, baboon dey chop.” He stated that Alganlaki will no longer provide farm inputs to farmers at no cost; instead, they will be sold to prevent a recurrence of previous issues. He noted that some farmers are yet to repay their loans (Tondel et al., 2020).

Transportation is also linked to the market conditions in Taraba State. Most imported rice must enter through locations with seaports, as it arrives in the country via large ports and borders predominantly located in significant rice-consuming regions. The commodity is transported from these places to other centers, including the production sites. The supplementary transportation expenses are evident in the comparatively high price of imported rice in the production regions. However, the circumstances in Taraba differ slightly, since there is an established presence of both local and international off-takers (processors), like Al'uma Rice Enterprise, Alganlaki, Mofido, UMZA, Popular, and Dominion Farms, all located in (TSNFDP III, 2015). The rice paddy or local rice are bought by these companies for processing after which is brought back and sold as foreign rice. Most producing areas will rather consume more of local rice than imported rice. The rice is also being transported to consuming states like Abuja, Calabar, Enugu, Lagos etc. (Tondel et al., 2020). Consequently, rice prices, the production status within the state, and the existence of numerous off-takers, along with potential buyers of rice products from other states, significantly impact the rice markets in Taraba State.

Another issue pertinent to rice marketing is consumer preference for either local or imported rice, typically influenced by several circumstances. A primary factor that substantially affects family preferences for local versus imported rice is associated with the income of the household head, household size, and the educational attainment of the household heads (Daudu et al., 2014). The inferior quality of the local rice significantly hampers its consumption by households. Nigerian consumers exhibit a clear preference for imported rice over locally produced rice, resulting in a market price premium for the former. The demand for rice in Nigeria is influenced by household budget and quality. The quality of rice is significant in its demand, even in rural regions. Rural families prioritize quality and exhibit a greater response than urban households to each 1% rise in income (Daudu et al., 2014). Furthermore, consumer preference for imported rice is predicated on its cleanliness, which elucidates its increasing consumption in Nigeria to the detriment of local rice market development. The extensive history of imported rice consumption in Nigeria has resulted in habit persistence, hence complicating the competition for locally produced rice. Research indicates that when household income and educational attainment increase, there is a preference for imported rice over indigenous rice.

This implies that despite enhancements in local rice quality, which can compete well with imported rice produced by large-scale farmers, consumer attitudes and perceptions regarding local rice remain a significant issue impacting its marketability. A marketing and policy shift favoring domestically produced items and the use of local content products is currently underway. However, the creation of tones necessary for local consumption is of greater importance, as Nigeria currently fails to produce sufficient quantities to satisfy domestic demand. Consequently, dependence on imports remains substantial. Nigeria is a significant participant in the international rice market. Notable participants in the global rice market in Africa include Madagascar, Côte d'Ivoire, and Egypt, among others. Nigeria now produces 7 million metric tons, while local demand reaches 10 million metric tons (Mellor, 1966). Merely 5% of global rice production

is involved in foreign trade. Additional global participants include China, India, Thailand, Vietnam, the United States and Pakistan. All nations in tropical Africa are net importers of milled rice (Udemeze, 2018). This indicates that almost one-third of rice consumption demand is satisfied by imports. The principal rice importers are Nigeria, Senegal, and Côte d'Ivoire.

Nigeria has become a significant importer of rice in the global market and a destination for rice-exporting nations (Udemeze, 2018). It emerges as a favorable market destination globally, not solely due to its population but also because customers favor high-quality imported rice over lower-quality rice from other nations in the sub-region. This underscores that if Nigeria enhances its rice sub-sector, it will significantly contribute to poverty alleviation among the rural poor, who are the primary producers, and would also assure food security. The global trade strategy for rice market development is compromised by the fragmentation of supply, which frequently deters commercial operators, exacerbated by the ambiguity of regulatory systems that jeopardizes their sustainability (Tondel et al., 2020). This is particularly relevant to countries such as Senegal, Nigeria, Mali, and Ghana. The market regulation is inadequate and requires reassessment, with the stringent enforcement of the ECOWAS Common External Tariff (CET), currently set at 10% for rice. Sanitary and phytosanitary controls are also inadequate. The data pertaining to the rice industry for monitoring measures and evaluations designed to assist merchants in procuring and distributing domestically produced rice, as well as institutional purchases that preferentially support local production, is a farce.

It is essential to acknowledge that ECOWAS currently lacks an effective shared trade policy. The current trade tools, particularly the Common External Tariff (CET) and the ECOWAS Trade Liberalization Scheme, remain ineffectual. The customs union has not yet been established let alone the common market. For instance, several member states have not yet implemented uniform additional import tariffs and taxes on rice, while certain countries charge customs duties that exceed the Common External Tariff (CET). Some have entirely ceased their application since the food crisis of 2008–2009. This occurs because domestic or national aims are prioritized over regional objectives.

4.6 Intervention by the Rice Farmers Association of Nigeria (RIFAN), Taraba State

The Taraba State branch of the Rice Farmers Association of Nigeria (RIFAN) is anticipated to safeguard and advocate for the interests of rice farmers in the state regarding production and marketing. The rural rice growers are to be protected within this framework. However, this has not occurred, as the leadership of the association has been usurped by large-scale rice cultivators and politicians with access to power. Consequently, rather than benefiting the majority of rice farmers, who are predominantly peasants, it primarily safeguards the interests of a select few large-scale farmers, who utilize the platform to obtain various interventions, so excluding the majority of rural farmers from the benefits.

Individuals in positions of authority have consistently exploited rural rice farmers over the years. They have achieved this success due to their status as politicians or their connections to the corridors of power. Consequently, the consecutive leadership of RIFAN Taraba State has predominantly been politicians or large-scale rice farmers that prioritize their own interests. The most recent leaderships of RIFAN substantiate our claim. Alhaji Yahaya Lau, a contemporary leader, is a large-scale farmer and an off-taker. He is engaged in both the cultivation and processing of local rice. He supervises more than five hundred farms. His role has enabled him to impact and participate in the Anchor Borrowers Program (ABP), initiated by the Federal Government in 2015 as an intervention in the agricultural sector, with rice as a primary focus. He was an off-taker/processor for the 2015/2016 rice season, with Zenith Bank providing financial services to his farmers. His secretary, Rabiu Mamman Rabiu, was a retired Director of the Federal Ministry of Agriculture.

Tanko Bobbo succeeded Alhaji Yahaya. Tanko is a politician engaged in large-scale agriculture. He was formerly a representative of Karim-Lamido in the Taraba State House of Assembly. Thus, influencing decisions as both a politician and a farmer which was within his grasp. The current leadership of RIFAN, though in acting capacity is headed by Alhaji Yaro Aya – another politician and former People's Democratic Party Chairman, Jalingo Local Government Area. These instances reinforce the notion that power dynamics within the rice economy of Taraba State primarily serve the interests of the elites, rather than the mainstream farmers who are the

actual contributors to rice production in both the state and Nigeria as a whole.

The dynamics of power have recently divided RIFAN Taraba State into two sections. In a demonstration of State authority over other participants in RIFAN, former Governor Alhaji Sani Abubakar Danladi usurped the leadership of RIFAN, an event referred to as RIFAN Special (TADP, 2015). His tenure from 2014-2015 as governor of the state coincided with the inauguration of the Anchor Borrower's Program (ABP). This positions him more favorably to comprehend the nature of the program and its implications for key stakeholders. It was little wonder, therefore, that he acquired an interest in the program. He founded his own RIFAN and exerts influence over the ABP to his advantage. This indicates that rural farmers were excluded from the advantages of the scheme, which were instead allocated to family, friends, and political affiliates. The roster of rice farmers registered under his name was fraudulent. This explains why, following Buhari's administration, which implemented the ABP, Danladi's RIFAN initiative ceased to exist naturally. Currently, RIFAN Taraba State is in turmoil, which accounts for Alhaji Yaro Aya assuming an acting role.

While it is not unlawful for a politician or a large-scale agricultural proprietor to lead RIFAN, it poses an issue when such leadership exclusively promotes their personal interests. This has been true for the aforementioned situations. Consequently, an umbrella organisation intended to offer protection for its members is, in fact, acting against to their interests. It is reasonable to assert that state power, in conjunction with large-scale farms, collaborates in the exploitation of rural farmers, as evidenced by the leadership of RIFAN. It is also significant to observe that this group of leaders has concurrently served as intermediaries. Their leadership roles have deliberately connected them with rural farmers across multiple places in the State. They have utilized this for green grabbing and the dispossession of rural farmers from their produce (Field Observation by Researcher, 2025).

Several farmers have opted to establish cooperatives to enhance the value of their produce and access additional services. They primarily participate in production for three purposes: preservation, subsistence, and commerce. They retain a certain quantity of rice for future growing, household sustenance, and commercial purposes, intending to generate monetary value to address everyday need. The market is extensive and significantly exploitative, prompting them to seek a just price for their produce. Market destinations include Kunini, Lau, Abbare, and Mayo-Lope, which serve as local market centers, while various local off-takers and agro-allied enterprises are solicited to purchase rice (Tondel et al., 2020). The farmers negotiate with local processors based on an agreed price, selling to a processing company that offers a comparable value for their produce. On certain occasions, these companies engage with farmers at the farm gate. Major millers such as Stallion, Umza, and Dominion, headquartered in Jalingo, the capital of Taraba State, procure rice paddy directly from the farm gate for subsequent transport to processing facilities. Despite this arrangement, the prices achievable are inadequate, given the labor required (Tondel et al., 2020).

The establishment of cooperatives by these farmers has facilitated their access to various initiatives. The Dry Season Farmers Association has successfully engaged with the state administration to get an intervention including NPK fertilizer. Each farmer received up to four bags per hectare. It is crucial to acknowledge that dry season farming is exceedingly costly, since the effective cultivation of one hectare of land necessitates approximately three million naira (3,000,000), a sum beyond the financial capacity of rural or peasant farmers. This indicates that the members of this category are, in fact, elite or large-scale farmers with substantial resources. The members substantiate this viewpoint, as the majority comprises politicians, top public servants, active and retired military generals, and police officers, among others.

5 Conclusion

The study investigated rice production and marketing systems in Taraba State, against the backdrop that food sovereignty in the country is a mirage. This is particularly the case in the rice sub-sector, where demand outweighs supply. Currently, the production capacity of the country stands at seven thousand metric tonnes, while demand is pegged at ten thousand metric tonnes. This is also obvious from the state rice output, which scarcely satisfies local demand. Findings emerged that the shortage is attributed to problems related to input supply, extension services, and access to optimal agronomic methods. Also, resolving the market issue in Nigeria will ensure that producers may sell their entire output, while consumers can consistently obtain their

desired products year-round. The efficacy or deficiency of the marketing system significantly impacts the future of rice production. If the independent farmer lacks a competitive market price for his product post-production or a strategy to mitigate price risk, he will be compelled to enter into a contractual arrangement.

To curtail these problems therefore, issues related to input supply, extension services, and best agronomic practices need to be deepened and widened by the state authority. The state would also have to do more in attracting investors by way of policy review that would provide the enabling environment to improve. The market network is not a rocket science. They are tied to the elements earlier mentioned, together with the issue of basic infrastructures like good road, warehouses, and transport system which are far beyond the reach of the peasants' farmers. The absence of these in most rice producing areas of the state, is responsible for short changing the peasants' farmers in terms of value allocation. Once a farmer does not receive good value in return for his labour, production would be affected and this would ultimately affect negatively the rice sufficiency of Taraba State within the national dynamics. Thus, the state, has to midwife these processes.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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